

AMENDMENTS TO THE DRAWINGS:

As required by the Examiner and subject to the Examiner's approval, Applicants propose to amend the drawings by labeling Figs. 1A-1F, 2A-2C, and 3A-3B as "Prior Art." Annotated sheets containing Figs 1A-1F, 2A-2C, and 3A-3B showing the changes to Figs. 1A-1F, 2A-2C, and 3A-3B in red and replacement sheets containing amended Figs. 1A-1F, 2A-2C, and 3A-3B are enclosed.

Attachments: Annotated sheets containing Figs. 1A-1F, 2A-2C, and 3A-3B showing the changes to Figs. 1A-1F, 2A-2C, and 3A-3B in red; and

Replacement Sheets containing amended Figs. 1A-1F, 2A-2C, and 3A-3B

REMARKS

By the present Amendment, Applicants have amended claims 1 and 10 to more appropriately define their invention. Applicants have also canceled claims 6 and 7, without prejudice or disclaimer of the subject matter thereof. Claims 1-5 and 8-23 are pending.

In the Office Action, the Examiner required that Figs. 1A-1F, 2A-2C, and 3A-3B be labeled as prior art; and rejected claims 1-8 and 10-14 under 35 U.S.C. § 103(a) as unpatentable over Koyanagi (U.S. Patent No. 6,191,002) in view of Goo et al. (U.S. Patent No. 6,489,252). The Examiner objected to claim 9 as dependent upon a rejected base claim, but allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Examiner allowed claims 15-23.

Applicants appreciate the indication of allowable subject matter. As the Examiner required and subject to the Examiner's approval, Applicants propose to amend the drawings by labeling Figs. 1A-1F, 2A-2C, and 3A-3B as "Prior Art." Applicants request the approval of the amendments to the drawings. The rejection of claims 6 and 7 is rendered moot in light of the cancellation thereof.

Applicants respectfully traverse the rejection of claims 1-5, 8, and 10-14 under 35 U.S.C. § 103(a) as unpatentable over Koyanagi and Goo et al., because a prima facie case of obviousness has not been established.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable

expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. M.P.E.P. § 2143, 8th ed., Revision of May 2004.

Independent claim 1 recites, inter alia,

forming an element isolation trench in a semiconductor substrate by using a mask member;

...

heating the second film at a temperature ranging from 200°C to 450°C in an atmosphere containing water vapor to provide the second film with CMP resistance;

removing part of said second film which is deposited on said mask member by CMP, thereby permitting a surface of said mask member to expose while selectively leaving behind part of said second film which is buried in said element isolation trench; and

subjecting said second film buried in said element isolation trench to burning oxidation treatment in an atmosphere containing water vapor to form an oxide film.

As the Examiner correctly recognized, "Koyanagi fails to disclose the step of removing the second film which is deposited on the mask member by CMP, thereby permitting a surface of the mask member to expose while selectively leaving behind part of the second film which is buried in the element isolation." Office Action, pages 3-4. The Examiner also alleged that "Koyanagi clearly discloses the step of CMP the oxide film (4) deposited on the mask member." Office Action, page 4; see also Koyanagi, Figs. 4E-4F, col. 8, ll. 60-67. However, Koyanagi's oxide film 4 is not subjected "to burning oxidation treatment in an atmosphere containing water vapor to form an oxide

film,” and therefore does not correspond to Applicants’ claimed second film. Therefore, Koyanagi fails to teach or suggest at least the CMP process as recited in claim 1.

Goo et al. fails to cure the deficiency of Koyanagi. The Examiner alleged that Goo et al. teaches “CMP the polysilazane layer (second layer after evaporating the solvent via curing) in the first film (col. 2 lines 43-65).” Office Action, page 4. However, Goo et al. only teaches that “when a polysilazane layer is formed to be relatively thick, a plane state of the whole surface of the substrate can be improved enough to carry out the subsequent process steps such as a chemical-mechanical polishing (CMP),” and does not teach “CMP the polysilazane layer.” Goo et al., col. 2, ll. 60-65. Goo et al. actually teaches a planarization process on CVD insulation layer 59, which is formed on an SOG layer 57 and comprises silicon oxide, where SOG layer 57 comprises polysilazane. Goo et al., col. 5, l. 24 - col. 6, l. 51. CVD insulation layer 59 is not then subjected “to burning oxidation treatment in an atmosphere containing water vapor to form an oxide film,” and therefore cannot correspond to Applicants’ claimed second film. Therefore, Goo et al. does not teach or suggest at least “removing part of said second film which is deposited on said mask member by CMP, thereby permitting a surface of said mask member to expose while selectively leaving behind part of said second film which is buried in said element isolation trench,” as recited in claim 1.

In addition, neither Koyanagi nor Goo et al. teaches or suggests at least “heating the second film at a temperature ranging from 200°C to 450°C in an atmosphere containing water vapor to provide the second film with CMP resistance,” as recited in claim 1.

Because Koyanagi and Goo et al., taken alone or in combination, fail to teach or suggest each and every element of claim 1, claim 1 is allowable over Koyanagi and Goo et al. Claims 2-5 and 8-9 depend from claim 1 and are also allowable at least because of their dependence from an allowable base claim.

In addition, independent claim 10 recites, inter alia,

heating the polysilazane film at a temperature ranging from 200°C to 450°C in an atmosphere containing water vapor to provide the polysilazane film with CMP resistance; [and]

removing said polysilazane film deposited on said mask member by CMP, thereby permitting a surface of said mask member to expose while permitting said polysilazane film to selectively remain inside said element isolation trench.

As noted above, Koyanagi and Goo et al. fail to teach or suggest at least these elements. Therefore, independent claim 10 is allowable over Koyanagi and Goo et al. Claims 11-14 depend from claim 10 and are also allowable at least because of their dependence from an allowable base claim.


In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: January 27, 2006

By: 
Qingyu Yin
Ltd. Rec. No.: L0222

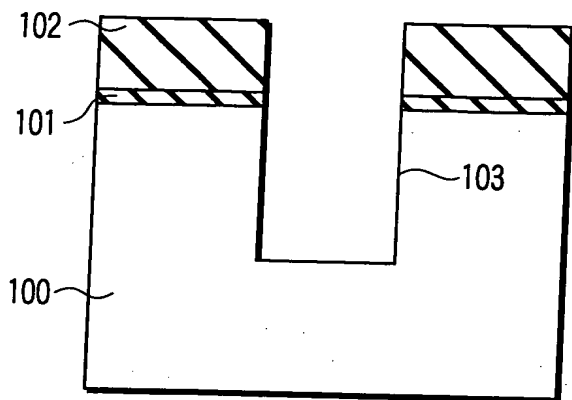


FIG. 1A
PRIOR ART

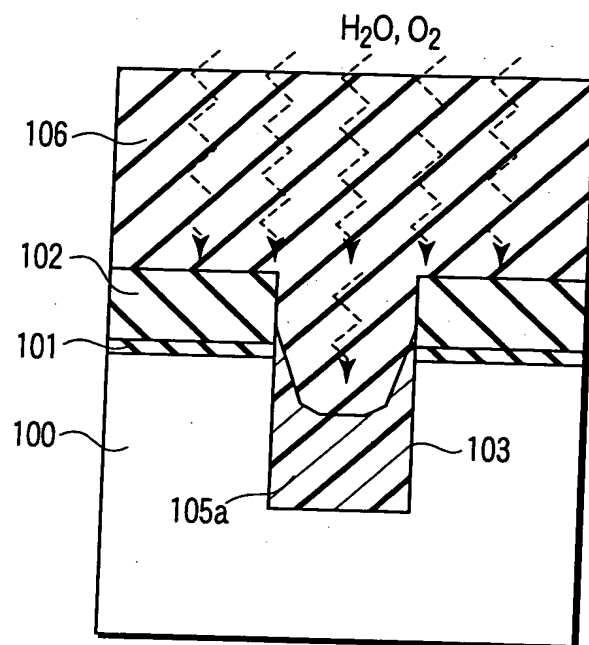


FIG. 1C
PRIOR ART

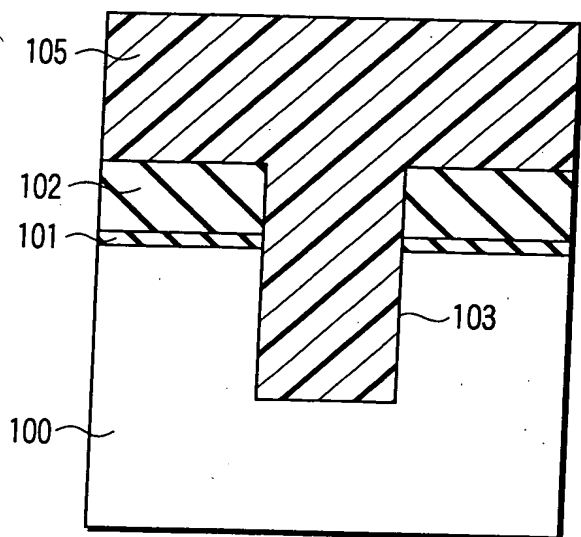


FIG. 1B
PRIOR ART

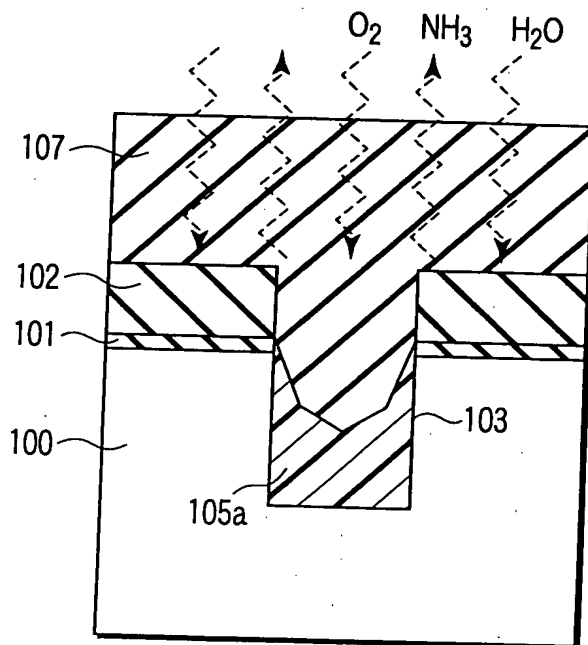


FIG. 1D
PRIOR ART

Annotated Sheet Showing Changes

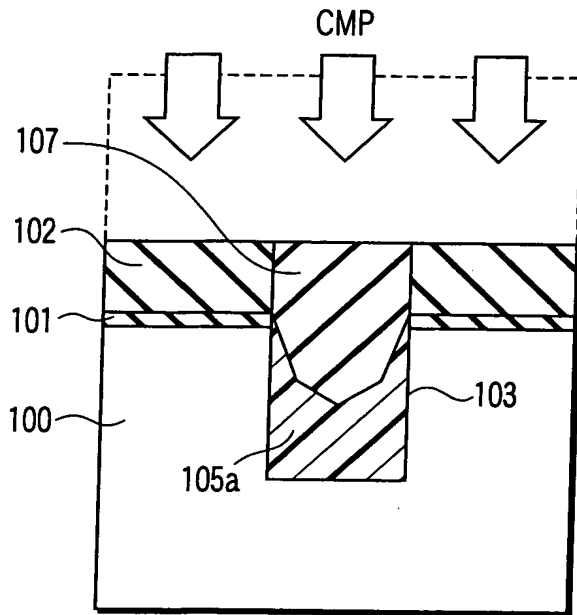


FIG. 1E
PRIOR ART

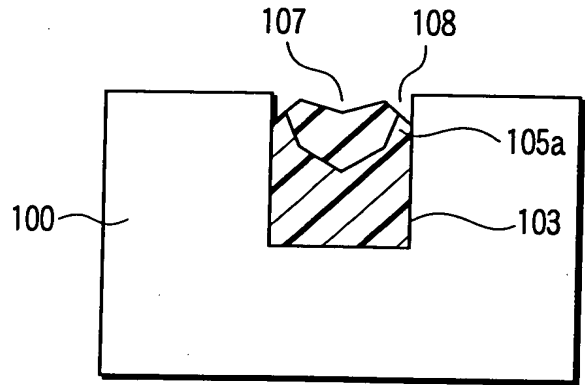


FIG. 1F
PRIOR ART

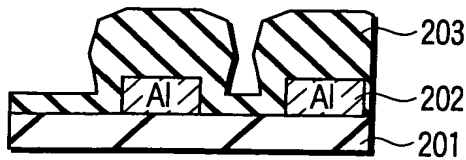


FIG. 2A
PRIOR ART

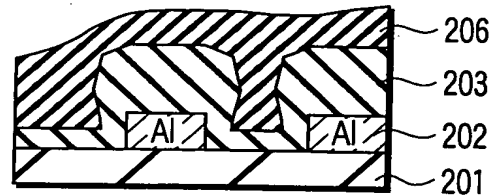


FIG. 3A
PRIOR ART

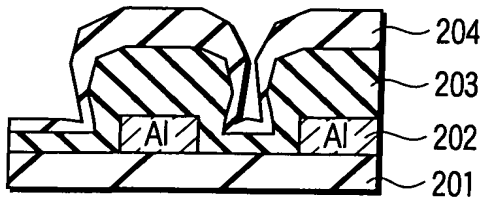


FIG. 2B
PRIOR ART

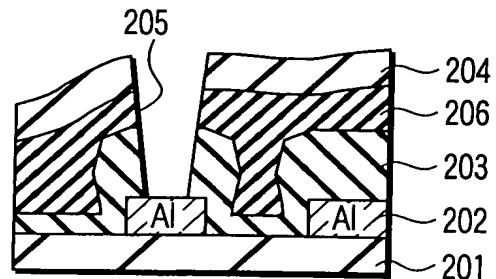


FIG. 3B
PRIOR ART

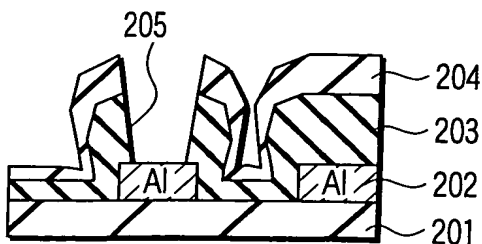


FIG. 2C
PRIOR ART